

REMARKS

Claims 1, 4-6, 8-10 and 14-24 are pending in the present application, dependent claims 21-24 being new.

Claims 1, 4-6, 8-10 and 14-20 in view of Igari and Admitted Prior Art

Claims 1, 8, 16 and 17 were rejected under 35 USC 102(b) as allegedly being anticipated by Japanese document No. JP404026226A ("Igari"); and claims 4-6, 9, 10, 14, 15 and 18-20 were rejected under 35 USC 103(a) as allegedly being obvious over Igari in view of applicant's admitted prior art (AAPA). The Applicant respectfully traverses the rejections.

Claims 1, 4-6 and 8 recite a switch matrix comprising a plurality of switching elements **exceeding** a number obtained by multiplying together a number of the at least one row conductor and a number of the at least one column conductor, wherein some of the switching elements are implemented to allow current to **flow bi-directionally** therethrough, and others of the plurality of switching elements are restricted to allow current to **flow only in one direction** therethrough.

The Examiner cites Igari for allegedly generally disclosing row conductors and column conductors as recited in the claims. (Office Action at 2-4) The Examiner admits that Igari fails to disclose the use of momentary and persistent type switching elements, but alleges that the background of the present specification discloses that such switching elements are conventional. (Office Action at 4).

Igari teaches a diode use on ALL switches, thus restricting current flow to only one direction for ALL switches in their keypad.

In particular, Igari teaches, in Fig. 2, what appears to be a switch matrix including 18 switches using only 3 columns and 3 rows. According to Igari, diodes are **stacked** between GROUND and the column drivers. By 'stacking' we refer to the **series** connection of multiple diodes to a particular column driver.

For example, when column I/O3 is driven in Fig. 2 of Igari, the voltage level of the upper left hand switch SW1 will be approximately **THREE** (3)

diode voltage drops (e.g., 2.1 volts). The same is true for all columns, and will get worse (i.e., the voltage drop will increase) as the switch matrix gets larger.

According to the present invention, one switch is allowed to have current **flow bi-directionally** therethrough such that current may be sourced from either terminal of the switch (e.g., see switches K1-K9 in Fig. 1), while others of the switches are restricted to allow current to **flow only in one direction** therethrough (e.g., see switches KA-KI in Fig. 1).

Igari teaches that ALL switches SW1-SW18 are restricted to allow current **flow in only one direction**, by use of diodes D1-D13. (See Igari, Fig. 1)

In particular, Igari teaches that in series with EVERY switch that is present, a diode restricts current to flow in only **one** direction.

It appears that Igari also teaches that a given number of permanent, jumpered positions may be read by the keypad, e.g., SW6 and SW12, wherein a diode is placed across terminals if the position is to be read closed, or the diode is left out of the jumpered position (e.g., SW9). In the jumpered positions SW6, SW12 and SW9, there is not only not a switch, but current can flow in only **one** direction anyway.

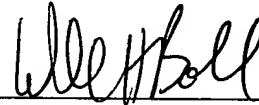
Claims 1, 4-6, 8-10 and 14-20 require switches that allow flow in BOTH directions therethrough, together with switches that allow current to flow in only one direction. Igari teaches use of only switches that restrict current to flow in only **one** direction.

For at least all the above reasons, claims 1, 4-6, 8-10 and 14-20 are patentable over the prior art of record. It is therefore respectfully requested that the rejections be withdrawn.

Conclusion

All objections and rejections having been mooted by the cancellation of prior claims, it is respectfully submitted that the subject application is in condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,



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